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ENTOMOLOGICAL NEWS

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John Clark

Notice has been received from Melbourne of the death of John [S.] Clark of Mooroolbark, Victoria, Australia, at his home on June 1, 1956. Mr. Clark was born in Glasgow, Scotland, on March 21, 1885. His interest in entomology continued from his early years in Scotland through his adult life in Australia, but it was not until 1920 that he was able to find employment near to his preferred field—as Assistant Entomologist to the Western Australian Department of Agriculture. During this period, he was the author of a series of papers on Australian forest insect pests and also began to publish basic articles on ants. In 1926, he became Entomologist to the National Museum of Victoria at Melbourne, a position he held for nearly twenty years. After World War II, he began work on an ambitious monograph of the ants of Australia, in this supported by grants from the Australian Commonwealth Scientific and Industrial Research Organization. To date, a single volume of this project has seen print, covering the characteristically Australian bull-ants (subfamily Myrmeciinae), and it is not known at this writing whether further volumes will be released.

Aside from the forest insect notes and a couple of papers on myrmecophilous beetles, Clark published almost entirely on the taxonomy of Australian ants. The most significant result of his life work adds up to some twenty articles and monographs, all published in Australia. He described somewhat more than 200 new species of ants, but probably half of these will prove to be synonyms. Although he worked in all of the main Australian ant groups, his most extensive revisionary efforts dealt with the Cerapachyinae (especially *Phyracaces*), the Myrmeciinae, the genus *Rhytidoponera* and the Australian Dolichoderini.

Clark was greatly handicapped, both in earning his livelihood and in pursuing his research, by the sketchiness of his formal education. It is a pity that he never received early training commensurate with his intelligence and drive. He suffered a number of personal and family calamities that cut seriously into his time and opportunities for research, and finally led to his living more and more the life of a recluse during his declining years.

His most notable single achievement was the discovery of the remarkable *Nothomyrmecia macrops,* probably the most generalized member of the family Formicidae yet found, living or fossil. This ant, which he described from two worker specimens sent him from an unknown locality in southwestern Australia, has since been the much-publicized object of a half dozen expeditions to the empty sandplain and mallee country to the east of Esperance. All of these searchers, Australian, English and American, have so far been unsuccessful in finding any trace of *Nothomyrmecia,* but the ant has a fascination for formicid specialists that is comparable to the excitement aroused among students of vertebrate evolution by the discovery of the living coelacanth.

At the time I visited him in 1950, Clark had among his working collections several other undescribed Australian ants of a totally unexpected nature, and it is hoped that the CSIRO authorities will be able to recover these samples for future study. The bulk of the Clark types are in the National Museum of Victoria at Melbourne, and many of them are also deposited in the British Museum (Natural History) and in the Museum of Comparative Zoology at Harvard. The type material of species described in his final monograph of the Myrmeciinae is deposited mostly in the collections of the Division of Entomology, CSIRO, Canberra, and it is assumed that this will be the place of deposit of the extensive collections he held at the time of his death, since many of the samples were the original property of the Division.

The entomological publications of John Clark for the earlier Australian period, 1921 through 1930, are listed by Musgrave

in his *Bibliography of Australian Entomology, 1775–1930,* published by the Royal Zoological Society of New South Wales at Sydney, 1932 (pp. 48–49, 240). Clark's publications between 1930 and the time of his death, so far as known, are listed below.

1934. Notes on Australian ants, with descriptions of new species and a new genus. Mem. Nat. Mus. Vict., Melbourne, 8: 5–20, Pl. 1, 1 text-fig.

1934. New Australian ants. *Ibid.,* pp. 21–47, Pls. 2, 3.

1934. Ants from the Otway Ranges. *Ibid.,* pp. 48–73, Pl. 4.

1936. A revision of the Australian species of *Rhytidoponera* Mayr (Formicidae). *Ibid.,* No. 9, pp. 14–89, Pls. 3–6, text-figs. 1–4.

1938. The Sir Joseph Banks Islands. Reports of the McCoy Society for Field Investigation and Research. Part I. Formicidae (Hymenoptera). Proc. R. Soc. Victoria (n.s.), 50: 356–382, 20 figs.

1941. Australian Formicidae. Notes and new species. Mem. Nat. Mus. Vict., Melbourne, 12: 71–94, Pl. 13.

1941. Notes on the Argentine ant and other exotic ants introduced into Australia. *Ibid.,* pp. 59–70, figs. 1–3.

1943. A revision of the genus *Promyrmecia* Emery (Formicidae). *Ibid.,* No. 13, pp. 83–149, Pls. 12–17, text-fig. 1.

1951. The Formicidae of Australia. Volume I. Subfamily Myrmeciinae. CSIRO, Melbourne. 230 pp., 193 figs.

W. L. Brown, Jr.,
Harvard University.

A New Species of Anastoechus Osten Sacken with Notes on the Congeners

By J. C. Hall, University of California Citrus Experiment Station, Riverside, California

The following description is given at this time in order to facilitate the return of borrowed material and to make the name available for future publications

The genus *Anastoechus* was described by Osten Sacken in 1877 with a single species, *barbatus.* Tucker in 1907 described

melanohalteralis. These two species, up to the present time, were the only two representatives of the genus in North America. *A. barbatus* is the most widespread representative of the genus and it is very common in the western states.

Anastoechus can be easily separated from its nearest relative *Systoechus* by the extremely dense pile on the face and the obtuse distal end of the discal cell.

The three species in the genus *Anastoechus* may be separated by the following key:

1. Knob of halteres white or yellow. 2
   Knob of halteres black; wings brownish on at least the basal half. ..... *melanohalteralis*
2. Abdominal segments five and six, sometimes seven, with black hair; a large species ..... *deserticola*, n. sp.
   Abdominal segments five, six, and seven with a few black hairs mixed with the white, black hairs usually white basally, a smaller species. ..... *barbatus*

Anastoechus deserticola n. sp.

The most easily recognized species within the genus, it differs from both *barbatus* and *melanohalteralis* by the broad band of black hairs on the distal segments of the abdomen, and by the larger size.

Female: Ground color black, apex of femora, all of tibia and tarsi yellowish-brown. Front gray cinereous, dense whitish pilose, long white tomentose, a few black hairs above antennae at sides, tomentum wanting medially between antennae and ocelli. Face densely covered with long, thick, white pile and tomentum. Proboscis projecting at least the length of the thorax beyond the oral opening. Occiput nearly entirely covered with white pile and tomentum, except on vertex where tomentum is wanting. Antennae black, first segment nearly four times longer than second, both with long, white hair; third segment about as long as basal two together, gradually and evenly tapering from moderately broad base to narrow, pointed apex, without pubescence. Thoracic dorsum and scutellum white pilose, without tomentum; bristles white; pleurae and coxae with snow-white pile and tomentum. Fore and middle femora with yellow scales on antero-dorsal surface, rest white

tomentose, white pile below; hind femora with yellow scales on antero-ventral surface, white scales elsewhere; tibiae with whitish-yellow scales overall, bristles yellow, except for a few black ones on apical half of hind tibia.

Wings hyaline, veins yellowish-brown; costal, basal part of marginal and first basal cell yellowish; widened base of costa with long black hair on anterior edge, white scales in middle and a narrow band of yellowish scales basally; first posterior cell closed and petiolate, anal cell broadly open. Halteres yellowish.

Abdomen with erect whitish hair, not dense, more or less confined to middle of segments; posterior margin of fourth segment with a single row of long bristle-like hair whose basal half is white, apical half black, and extreme tip white; fifth and sixth segments with a broad crossband of black hair, a few white hairs intermixed, bristle-like hair on posterior margins of fifth and sixth segments black except white tips; hair on segments five, six, seven directed backward forming a rosette around genital opening; segment seven orange with white pile; abdominal tomentum wanting except for a very few scales forming an obscure median line from segment two to segment four; venter black, posterior margins of all segments white, white pilose and tomentose, a few hairs near tip of abdomen with black tips. Length 10–12 mm.

Male: Nearly identical to female, but differing in the following ways in addition to the usual sexual differences: Tomentum of front wanting; black hair on front extending downward along eye margin to approximately middle of face. Bristles of hind tibia entirely yellowish. Abdomen with a larger number of black tipped hairs, a few being present at sides of second segment and increasing in extent posteriorly. Venter yellowish-brown, each segment with a broad, white posterior margin. Genitalia orange, harpagones with short, white hair.

Variations: The extent of variation in the specimens studied is very slight. The main variations are in the color of the wing infuscation, from yellow to brown, and in the number of black-tipped abdominal hairs anterior to the fifth segment.

Holotype female, Picacho Pass, Pinal Co., ARIZONA, 9-13-54 (J. C. Hall); *allotype* male, 10 mi. W. of Blythe, Riverside Co.,

California, 10-2-54 (J. C. Hall). Both in the California Academy of Science, San Francisco, California.

Paratypes, 1 ♂, same data as allotype; 2 ♂♂, S. Lancaster, Los Angeles Co., California, 9-46 (F. R. Cole); 1 ♀, Oro Grande, San Bernardino Co., California, 10-28-34 (P. H. Timberlake); 1 ♂, 10 mi. E. Tucson, Arizona, 9-24-47 (E. R. Tinkham), all in the Author's collection; 1 ♂, San Xavier, Arizona, 10-10-47 (E. R. Tinkham); 1 ♀, Trans-Pecos, Franklin Mts., Texas 10-8-46 (E. R. Tinkham), in the collection of E. R. Tinkham; 1 ♂, 9 mi. W. Blythe, Riverside Co., California, 10-2-54 (P. H. Timberlake), in the collection of P. H. Timberlake.

Anastoechus barbatus Osten Sacken

1877. Western Diptera. Bull. U. S. Geol. Geog. Survey of Terr. 3: 252.

A considerable amount of controversy exists in the literature as to whether or not this species is the same as the European *A. nitidulus* (Fab.). Coquillett, 1894, considered the two to be the same. Cresson, 1919, noticed that all the Old World species seen by him possessed tomentum on the abdominal dorsum; while very little if any tomentum exists on the abdomen of the North American specimens. I have not seen any of the European specimens, but from the available descriptions I am inclined to agree with other workers who have followed Cresson's findings in that the two, while similar, are distinct.

A. barbatus is found almost everywhere in the West. While nothing is known concerning the biology of this species, I have collected them many times in association with grasshoppers. It is believed that they are predaceous upon the egg pods.

Anastoechus melanohalteralis Tucker

1907. Some results of desultory collecting of insects in Kansas and Colorado. Kansas Univ. Sci. Bull. 4: 89.

This species, while not as common as *barbatus,* is widespread at least throughout California, Arizona, Nevada, Colorado, Utah, and New Mexico. The easiest character used for separating

this species from *barbatus* is the black halteres. The infuscated wings are subject to some variation and are therefore not too reliable for separation. The resemblance to *barbatus* is rather remarkable in both size and pilosity.

Nothing is known about the life history, but I can seen no reason for not accusing this species of also being predaceous upon grasshopper egg pods.

Description of the Sugar Beet Root Maggot, Tetanops myopaeformis (von Roder), With Observations on Reproductive Capacity †

By W. L. Gojmerac *

The sugar beet root maggot has been receiving considerable attention in North Dakota. This insect has been identified as *Tetanops myopaeformis* (von Röder), Family Ortalidae.**

According to published information the sugar beet root maggot has been previously associated with sugar beets grown under irrigation in several western states and Canadian provinces. Regulation of soil moisture supplemented with seed treatment has been a means of controlling this insect (1). Rather severe outbreaks of the sugar beet root maggot occurred in North Dakota during 1954 and 1955. Serious damage was also reported in several Canadian provinces during 1955. Controls under dryland conditions were studied in North Dakota during 1955 (2, 3).

This insect was originally named and described by von Röder in 1881 as *Eurycephala myopaeformis* from California (4). He placed it in the Subfamily Ulidiinae, Family Ortalidae. The genus was preoccupied so Hendel in 1907 proposed to change the name to *Eurycephalomyia* (5). Williston in his 1908 manual

† Approved for publication by the Director of the North Dakota Agricultural Experiment Station as a contribution from the Department of Entomology (Project BJ–5,44).

* Assistant Entomologist, North Dakota Agricultural Experiment Station, Fargo, North Dakota.

** By Insect Identification & Parasite Introduction Section, P. W. Oman, Head.

of Diptera, using only descriptions, placed the genus among the Ulidiinae (6). In 1900 Coquillett redescribed *myopaeformis* as *polita,* placing it in the genus *Tetanops.* His description was based on three females from Colorado (7). The genus *Tetanops* was described by Fallen in 1820. In 1911 Hendel gave this insect its third name, *Tetanops aldrichi,* basing his description on specimens from Idaho (8). Aldrich, in 1931, on checking von Röder's description believed all the above names were synonyms. Confusion arose from having *Eurycephalomyia* in the wrong subfamily. According to Aldrich it belongs in Ortalinae (9).

A check of the common names of insects reveals that no name has been accepted for *Tetanops myopaeformis.* The name "sugar beet root maggot" has been in use for a number of years, and has been submitted to the Committee for recognition and approval.*

No descriptions of the immature forms of this insect are found in the literature which would aid in recognizing or distinguishing these from other soil-inhabiting Diptera. Coquillett's description of the adult fly with additional descriptions and illustrations will be helpful in separating this fly from others. Observations on the reproductive potential were also made. Results of these findings are reported here.

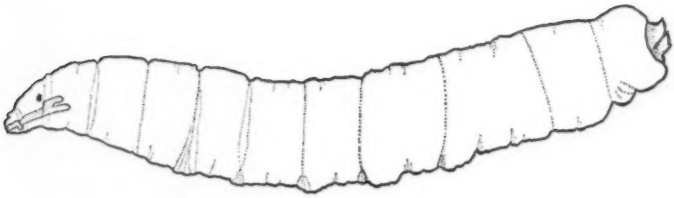
Methods

Larvae and adults were preserved in 70 per cent alcohol. To study larval characters, larvae were heated in a dilute solution of potassium hydroxide, washed, passed through a series of alcohols and xylol, then mounted in balsam. Others were dis-

* Submitted by J. A. Callenbach, Entomologist, N. Dak. Agric. Exp. Sta., to Committee on Common Names of Insects, Entomological Society of America, on March 24, 1955.

Explanation of Figures

1. Mature maggot.
2. Posterior spiracular plate.
3. Posterior spiracular slit.
4. Anterior spiracle
5. Cephalo-pharyngeal skeleton.
6. Puparium.



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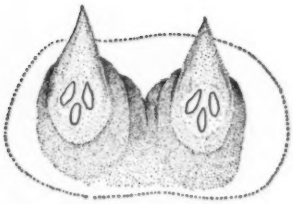

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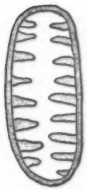

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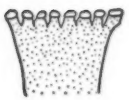

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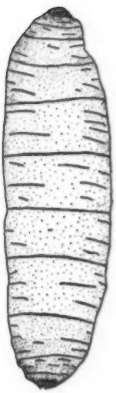

6.

5.

sected and parts mounted in balsam without clearing. Adult flies were dissected in 95 per cent alcohol. Drawings were made with the aid of a microprojector.

Eggs. The eggs are slightly curved, white, and approximately 1 mm. long.

Larvae. Only mature larvae will be described. Though many small larvae were collected, no distinct morphological differences were noted to permit separation into instars or stages with any degree of accuracy. Variations in size were noted. Therefore, all measurements should be considered as approximate. The larvae are muscidiform (fig. 1), 10–12 mm. in length; intersegmental constrictions are distinct, each intersegmental region bearing a network of minute spines. The caudal end terminates in two elevated oblique spines. The dorsal surface of each spine bears an oval spiracular plate (fig. 2). Distance between spiracular plates 0.133 mm. Diameter of spiracular plate at narrowest point 0.1 mm. Spiracular slits are arranged subparallel, 0.04 mm. in length (fig. 3). Prothoracic spiracle yellowish, usually eight digits (fig. 4). Cephalo-pharyngeal skeleton black (fig. 5), length from tip of mandibular sclerite to posterior end of pharyngeal sclerite 0.6 mm. Width of pharyngeal sclerite 0.2 mm.

Pupae. On the puparium the spiracles are apical (fig. 6); the spines are distinctly visible. As in the larvae, the intersegmental constrictions are distinctly visible. Puparium is approximately 8 mm. in length.

Adults. Coquillett's description of *Tetanops polita* is similar to that of *Tetanops myopaeformis* found in North Dakota (figs. 7 and 8). His description is as follows: "Front wrinkled, wholly punctured, not pruinose, yellowish-brown, the upper part of the sides dark brown, face, cheeks and lower part of occiput yellowish-white, a brown spot on either side of center of face,

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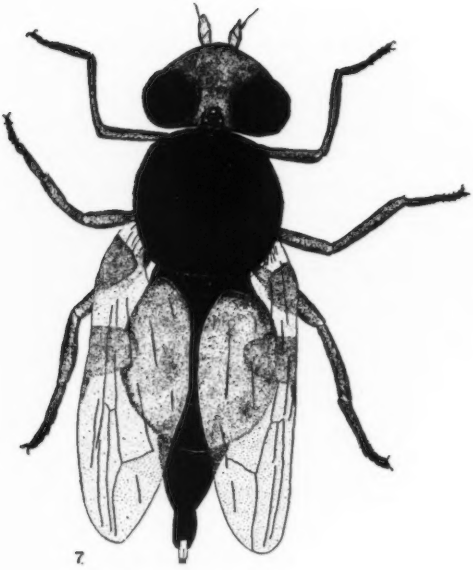
EXPLANATION OF FIGURES

7. Adult.
8. Wing.
9. Posterior end of female.
10. Ovipositor extended.
11. Posterior end of male.
12. Male genitalia.



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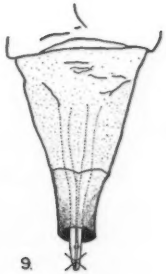

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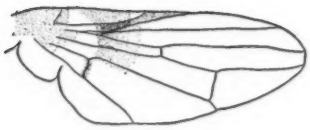

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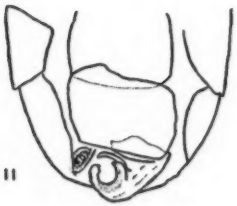

11.

12.

upper part of occiput polished brown, antennae brown, the first two joints yellowish, proboscis brown, palpi yellowish; body polished black, mesonotum finely punctured; legs brown, the knees and bases of tarsi yellowish, halteres pale yellow; wings grayish hyaline, the base to slightly beyond humeral cross-vein pale brownish, a pale brown crossband nearly fills the first costal cell and extends to the fourth vein slightly beyond base of discal cell. Length, 5.5 mm. Habitat: Colorado. Three females. Type No. 4470, U. S. Nat. Museum."

In addition to the above features the genitalia are worthwhile noting. The female is characterized by a long ovipositor, the tip of which possesses four spines (fig. 9). The ovipositor can be extended to nearly twice its length at resting position (fig. 10).

The male genital region is asymmetrical (fig. 11). The phallic organs are in a pouch on the right side. The aedeagus is a long, slender coiled tube (fig. 12). At rest the aedeagus is turned forward in the phallic pouch above the eighth sternum.

Flies were caught between June 14 and June 22 by sweeping a net over beets in a heavily infested sugar beet field. Six such

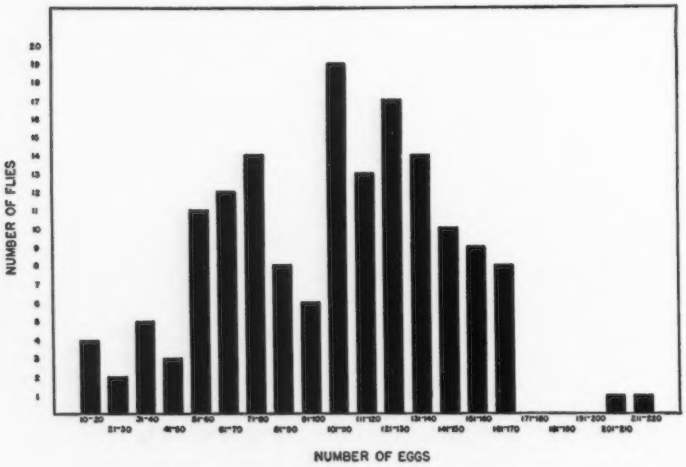

FIG. 13. Histogram illustrating reproductive potential.

collections were made. Four hundred eighty-eight flies were captured. Of these, 298 were males and 190 were females. Whether this is an accurate estimate of the sex ratio is not known since it was impossible to make studies on the behavior in the fields this last year.

One hundred sixty-five females were dissected to determine the reproductive potential. It is not known whether some flies caught and dissected had already laid a portion of their eggs. Flies were then divided into classes according to the number of eggs. The histogram (fig. 13) summarizes the data, and shows the mode of between 101–110 eggs per female. One female contained 219 eggs.

Summary and Conclusions

Outbreaks of the sugar beet root maggot have occurred in North Dakota and the western provinces of Canada during 1954 and 1955.

A review of the literature reveals that this insect has been described as *Eurycephala myopaeformis,* subsequently named *Tetanops polita, Tetanops aldrichi,* and finally *Tetanops myopaeformis.*

Descriptions of the stages in the life cycle are given along with appropriate illustrations.

Observations on the reproductive capacity of captured flies reveal a modal value of approximately 100–110 eggs per female. A few females were found to contain over 200 eggs.

Acknowledgments

The author is grateful for the constructive criticism offered by Dr. J. A. Callenbach, North Dakota Agricultural College, and Dr. C. L. Fluke, University of Wisconsin.

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Undescribed Species of Crane-Flies from the Western United States and Canada (Dipt.: Tipulidae)

Part XVI

By CHARLES P. ALEXANDER, University of Massachusetts, Amherst, Massachusetts

The preceding part under this general title was published in ENTOMOLOGICAL NEWS, 66: 125–132, 1955. At this time I am discussing certain species of the genus *Hexatoma,* most of which were sent to me for determination by the late Professor James Speed Rogers, who had received them from the University of Kansas. The types of these species will be returned to the University of Michigan for re-distribution. One further species from Oregon was collected by Mr. Kenneth M. Fender and is preserved in my personal collection of these flies.

Hexatoma (Eriocera) pacifica new species

Belongs to the *spinosa* group; general coloration gray, the praescutum with four brownish black stripes, additional to the lateral borders; antennae long, approximately twice the length of the body, with long setae virtually to the tip; head and thorax with long erect setae, postnotum and pleura chiefly glabrous; fore femora obscure yellow, with more than the outer half black; wings relatively short and broad; outer radial branches, including R_3 and R_4, with conspicuous trichia.

♂. Length about 12–14 mm.; wing 14–16 mm.; antenna about 22–25 mm.

Rostrum black; palpi long and conspicuous, black. Antennae of male elongate, nearly twice the body; scape brownish yellow, blackened above, pedicel dark brown, flagellum black; flagellar segments very elongate, the more proximal ones with strong emergence bristles, on the outer segment becoming much longer and more delicate, persisting virtually to the end of the organ. Head dark brown, more fulvous on either side of the large vertical tubercle; vertex with abundant erect setae.

Pronotum brownish gray. Mesonotum grayish yellow, with four brownish black stripes, additional to the darkened lateral borders; each scutal lobe with a comparable brownish black area; scutellum more brownish yellow pollinose, postnotum black; praescutal interspaces and scutellum with conspicuous erect pale setae, postnotum glabrous. Pleura black, with a brownish yellow pollen in places. Halteres dark brown, base of stem obscure fulvous. Legs with all coxae dark brown, trochanters more fulvous beneath; fore femora obscure yellow basally, with more than the outer half black, posterior femora brownish yellow, with about the outer fifth blackened; tibiae and basitarsi reddish brown, tips narrowly darkened; remainder of tarsi passing into black. Wings relatively short and broad, as compared with *solor;* membrane strongly darkened, especially adjoining the veins; stigma darker brown; veins dark brown. Outer medial veins without trichia; outer radial branches, including R_3 and R_4, with conspicuous trichia. Venation: Cell *1st* M_2 long, its inner end arcuated; cell M_1 present.

Abdomen brownish black, the tergites sparsely hairy; hypopygium more reddened.

Habitat. CALIFORNIA. *Holotype:* ♂, Pacific, El Dorado County, August 9, 1940 (L. C. Kuitert). *Paratopotypes:* 3 ♂♂ (L. C. Kuitert & L. J. Lipovsky).

The most similar species in *Hexatoma* (*Eriocera*) *solor* Alexander, which differs in the shorter male antennae, coloration of the body and legs, and in the trichiation of the wing veins.

Hexatoma (Eriocera) beameri new species

General coloration of entire body orange or chestnut, the thorax with the exception of the praescutum more pruinose; abdomen elongate, with a subterminal blackened ring; antennae with basal segments yellow, outer ones black; vertical tubercle deeply divided; femora black, bases narrowly yellowed; wings weakly tinged with brown, vaguely patterned with darker brown; veins unusually glabrous.

♂. Length about 12–14 mm.; wing 10–14 mm.; antenna about 3–3.4 mm.

♀. Length about 19–20 mm.; wing 14 mm.; antenna about 3 mm.

Rostrum short, yellow, narrowly blackened above; palpi brownish black. Antennae of male 7-segmented, of female 11-segmented, short in both sexes; basal three segments yellow, succeeding ones black; flagellar segments cylindrical, the first exceeding in length the succeeding two combined; setae short. Head orange, more pruinose on genae; vertical tubercle deeply divided into two halves by a narrow notch.

Pronotum light brown, pruinose. Mesonotal praescutum light chestnut, the lateral margins pruinose; scutal lobes chestnut in front; remainder of notum similar but the color more obscured by pruinosity. Pleura brownish yellow, sparsely pruinose. Halteres with stem yellow, knob dark brown. Legs with the coxae yellow to brownish yellow; trochanters yellow; femora black, the bases narrowly yellow; tibiae brownish yellow, tips narrowly blackened; tarsi passing from light brown to brownish black. Wings with a weak brownish tinge, prearcular, costal and stigmal areas slightly darker brown, in cases with a weak brown cloud over anterior cord and adjoining veins; veins pale brown, darker in the patterned areas. Veins unusually glabrous; a few scattered trichia on distal section of vein R_5. Venation: *Sc* relatively long, Sc_1 ending shortly beyond level of *r–m;* R_{1+2}, R_2 and R_{2+3} all subequal; basal section of R_5 in cases twice as long as *r–m;* cell M_1 lacking; *m–cu* at near one-third to one-fifth the length of the subrectangular cell *1st* M_2, longer than the distal section of Cu_1.

Abdomen long in both sexes, fulvous, in some males with the posterior borders of the basal and intermediate tergites weakly darkened; segments six to nine chiefly blackened, with reddish tints; sternites chiefly reddish yellow, the seventh segment black, ninth sternite fulvous; other males and the female with the abdomen chiefly fulvous, with a subterminal blackened ring; genital shield fulvous, tipped with black; ovipositor with cerci long, sclerotized, blackened.

Habitat. TEXAS. *Holotype:* Concan, Uvalde County, July 6, 1936 (R. H. Beamer). *Allotopotype:* ♀. *Paratopotypes:* 3 ♂♀.

I am very pleased to dedicate this species to Mr. Raymond H. Beamer, Curator of the Snow Collection of the University of Kansas for many years, and most diligent collector of insects in many groups. The fly is quite distinct from anything in the Nearctic fauna, being more like *Hexatoma* (*Eriocera*) *obsoleta* (Williston), of Honduras, and a few allied forms in Tropical America, differing from all in every detail of coloration.

Hexatoma (Eriocera) fulvomedia new species

General coloration of head fiery orange; vertical tubercle conspicuously bifid; antennae with basal and outer segments dark brown, the intermediate flagellar segments yellow; mesonotum with a broad orange or fulvous median stripe extending the entire length, the sides of the sclerites darker; pleura liver brown, more or less variegated by brighter areas; femora yellow basally, the tips broadly blackened; wings strongly darkened, especially the prearcular and costal fields; abdomen orange, in male with the terminal segments darkened, in the female with slight indications of dark color on tergites six and seven.

♂. Length about 11 mm.; wing 9.5 mm.; antenna about 2 mm.

♀. Length about 18–19 mm.; wing 13.5–15 mm.; antenna about 3 mm.

Rostrum and palpi brownish black. Antennae short in both sexes; in male, scape and pedicel light brown, flagellum obscure yellow; in female, scape and pedicel dark brown, base of flagel-

lum yellow, the terminal three segments dark brown; antennae 7-segmented in male, 9-segmented in female; flagellar segments with coarse setae but without spines. Head above, including the conspicuous bifid vertical tubercle, fiery orange; sides of vertex and genae dark brown, more extensively so in the male.

Pronotum dark brown. Mesonotal praescutum with the central area fulvous brown in female, less brightened in the male, evidently including a pair of more grayish intermediate stripes that are divided by a more reddened to infuscated line, best indicated in front; sides of praescutum brown; central region of scutum, including more than the inner half of each scutal lobe, the scutellum and the postnotum yellow or orange, most brilliant in the female. Pleura and pleurotergite more liver brown, in cases with vague more brightened areas on the pleurotergite and sternopleurite, in cases the latter more conspicuous. Halteres infuscated. Legs with the coxae dark brown, more or less pruinose, the fore pair more brightened apically; trochanters yellow; femora yellow basally, the tips broadly blackened, in the male more uniformly light brown; tibiae and tarsi brown, darker in the female. Wings strongly darkened, especially the prearcular and costal fields; less evident darkened seams over the radial field and along vein *Cu* in cell *M;* veins brown. Veins beyond cord virtually glabrous except for very sparse trichia on distal section of vein R_5. Venation: R_{1+2} subequal to or a little shorter than R_{2+3}; fork of *Rs* acute; cell M_1 lacking; *m–cu* about one-third to one-half times its length beyond the fork of *M*.

Abdomen orange, in male with the fifth and succeeding segments dark brown to form a broad ring, in the female this merely indicated by darkened areas on segments six and seven, not or scarcely including the whole segment; genital shield of female orange, yellow pollinose; ovipositor with cerci relatively short and stout, straight.

Habitat. ARIZONA. *Holotype:* ♀, Chiricahua Mountains, Cochise County, July 8, 1932 (R. H. Beamer). *Allotopotype:* ♂. *Paratopotypes:* 5 ♀♀, July 4, 1940 (R. H. Beamer, D. Elmo Hardy and L. J. Lipovsky), July 3, 1947 (R. H. Beamer).

There is no very close relative in the Nearctic fauna. It appears to be most nearly allied to *Hexatoma* (*Eriocera*) *rubrinota* (Alexander), despite the different coloration.

Hexatoma (Eriocera) velveta apache new subspecies

Very similar to the typical form in the short stiff black erect to subproclinate bristles on the vertex and the virtually glabrous mesonotum. Lateral praescutal stripes and darkened areas on scutal lobes much less conspicuous, dark gray instead of brown. Legs black, the proximal third (fore legs) to half (hind legs) of the femora yellow. In typical *velveta* only the femoral tips are darkened.

Habitat. NEW MEXICO. *Holotype:* ♂, Mescalero Apache Reservation, Sacramento Mountains, near Cloudcroft, Otero County, 7,000 feet, June 1, 1942 (C. P. Alexander).

Hexatoma (Eriocera) dorothea new species

General coloration gray, the praescutum and scutum patterned with black; antennae of male 8-segmented; vestiture of head long, black, of the praescutal interspaces long and pale; legs black, the femoral bases rather narrowly yellow, including about the proximal half; wings brownish yellow, with a restricted darker brown pattern; macrotrichia of veins very sparse; cell *1st* M_2 elongate, its inner end arcuated.

♂. Length about 13 mm.; wing 13 mm.; antenna about 3 mm.

Rostrum and palpi black. Antennae of male 8-segmented, black throughout; first flagellar segment about as long as the succeeding two combined, with about four strong bristles; remaining segments with fewer such bristles; terminal segment subequal in length to the penultimate. Head dark brown behind, more pruinose on genae and in front, including the vertical tubercle; anterior vertex broad, the eyes correspondingly small; vestiture of head black, relatively long and conspicuous, longer than in *velveta*.

Prothorax gray, dark brown on sides. Mesonotal praescutum light gray with four conspicuous nearly black stripes,

the intermediate pair separated by a ground area that is fully one-half as wide as either stripe; lateral border behind the fovea not darkened; interspaces with abundant long pale setae; posterior sclerites of notum light gray, each scutal lobe with a conspicuous dark brown area; postnotum glabrous. Pleura gray; dorosopleural membrane dark brown. Halteres with stem light brown, knob dark brown. Legs with the coxae gray pruinose, with long pale setae; trochanters dark brown; remainder of legs black, the femoral bases yellow, including about the proximal half only, still narrower on the fore legs. Wings brownish yellow, with a restricted darker brown pattern, including the stigma and narrow seams at origin of *Rs*, over cord, and at outer end of cell *1st* M_2; veins brown. Macrotrichia of veins very sparse, beyond the cord and behind R_1 including only a sparse series over most of the length of the distal section of vein R_5. Venation: Sc_1 ending shortly before the fork of R_{2+3+4}, Sc_2 opposite midlength of this vein; R_{1+2} about three times R_2; cell *1st* M_2 elongate, its inner end arcuated, about in transverse alignment with cell R_4, the cell about equal in length to the distal section of vein M_{1+2}; cell M_1 lacking; *m–cu* at near two-fifths M_{3+4} or nearly in alignment with *r–m*.

Abdomen black, gray pruinose; transverse basal impressions of the tergites black, distinct.

Habitat. OREGON. *Holotype:* ♂, Happy Valley, near McMinnville, Yamhill County, May 12, 1946 (Kenneth M. Fender).

I am very pleased to name this species for Mrs. Dorothy McKey-Fender (Kenneth Mark Fender), student of the western American Annelids and certain groups of fire-flies. The type specimen had been recorded earlier (Amer. Midl. Nat., 51: 68, 1954), as being *Hexatoma* (*Eriocera*) *velveta* (Doane), which is the nearest ally, differing in the nature of the vestiture of the head and thorax, coloration of the legs, and in the venation. It is now apparent that various species have been confused under the name of *velveta*.

Outstanding Collection to Smithsonian Institution

Dr. Frank Morton Jones, Wilmington, Delaware, spent over 60 years gathering a superb world collection of Psychidae (bagworms), some of which are important as pests of ornamental trees and shrubs. This collection consists of 4400 specimens of which 1174 are adult, winged males, 2133 consist of bags showing the many forms resulting from differences in food plants, 820 are immature forms and, in addition, there are approximately 1000 microscope slides. There are 6 holotypes. In connection with rearing these moths Dr. Jones acquired 273 parasitic Hymenoptera, all associated with their hosts. With this collection has come 36 volumes pertaining to the Psychidae, numerous separata and many unpublished drawings and photographs.

Dr. Jones' collection was assembled with painstaking care and the specimens are carefully prepared. The Jones Collection, combined with material previously assembled, gives the Smithsonion Institution the foremost American collection of this group of insects.

J. F. Gates Clarke,
Curator, Division of Insects

Entomological Departments

Believing such material to be of interest to its readers, Entomological News herewith solicits articles similar to the one here presented and giving information on the organization and activities of entomologists in colleges, universities, museums, and in government and other groups.

Entomology Department

State Plant Board of Florida

The State Plant Board of Florida was created by Legislative Act on April 30, 1915. Citrus canker, a bacterial disease of citrus, was threatening the industry, and an immediate function of the Board was to look to the eradication of this disease and the prevention of its further spread. The eradication of this disease from Florida in 1932 constituted the first complete

eradication of a bacterial disease from an extensive area. Success in this campaign formed the basis for eradication of the Mediterranean fruit fly in 1930 and the citrus black fly in 1938.

The Act creating the State Plant Board stipulated that its offices should be provided by the UNIVERSITY OF FLORIDA at Gainesville. The Board was to be the regulatory agency for all plant diseases and pests in Florida. Under the direction of a plant commissioner there were formed departments of Entomology, Nursery Inspection, Port and Railway Inspection (which later became the Quarantine Inspection Department) and Plant Pathology.

Dr. E. W. BERGER was appointed as Entomologist in Charge of the ENTOMOLOGY DEPARTMENT, with A. C. MASON as Assistant Entomologist. Mr. Mason was succeeded in this post by Mr. C. E. WILSON, who in turn was succeeded by Mr. F. F. BIBBY. Both Wilson and Bibby entered military service in 1918, and the post was filled by Mr. GEORGE B. MERRILL, who later was to become Chief of the Department and who retired in January, 1956, after forty years of service.

In 1919 the Florida State Legislature passed The Bee Disease Act, and the APIARY INSPECTION DEPARTMENT was created. C. E. BARTHOLOMEW became Assistant to the Plant Commissioner on July 1, 1919, and thus became the first Apiary Inspector in Florida. He shortly resigned, and was succeeded in turn by CHARLES A. REESE, J. C. GOODWIN, R. E. FOSTER, and finally, in 1948, by the present Chief Apiary Inspector, Mr. H. S. FOSTER.

The Entomology Department remained unchanged under the direction of Dr. Berger until his retirement on January 1, 1943. Dr. Berger's investigations and work with entomogenous fungi had won him international recognition. He had been active in the eradication of a bacterial disease, as well as the eradication of two insect pests, from the State of Florida.

Upon Dr. Berger's retirement, Mr. Merrill became Chief Entomologist. Mr. Merrill made notable contributions to a knowledge of the scale insects of Florida.

After the close of World War II, Mr. GEORGE W. DEKLE, who had been associated with the Board prior to the war, became Assistant Entomologist.

Expansion of the Entomology Department took place in 1953, when three entomologists were added to the staff, making a total of five. In 1955, a sixth entomologist joined the staff.

Under the direction of Dr. Berger and Mr. Merrill, the State Plant Board had built one of the finest entomological libraries in the Southeast. The library has complete sets of most of the American entomological journals, as well as many of the foreign publications and many separates, reference and text books.

Since the State Plant Board Department of Entomology is providing an insect identification service for Florida, a comprehensive insect collection became essential. The reference collection which in 1953 numbered about 30,000 specimens has since been expanded and now numbers more than 90,000 pinned specimens, plus nearly 10,000 slide mounts and vials of insects preserved in alcohol. The 15,000 Syrphidae in Dr. WEEMS' personal collection are also available for study. The State Plant Board intercepts many insects at the ports of entry, and collections by the approximately 100 port, nursery, and grove inspectors have aided considerably in the building of the reference collection. The objective is to develop a comprehensive collection, primarily of Florida insects, and representatives of foreign insect species which pose a threat to Florida agriculture. Emphasis is on economic groups, such as scale insects, aphids and some of the fruit flies.

Since January, 1954, the Department has been conducting an insect pest survey, a project co-ordinated by the federal government. Weekly mimeographed bulletins, averaging three to four pages, are issued by the Department to Plant Board field men, as well as other entomologists in the State.

An annotated check list of Florida Lepidoptera, compiled by Mr. C. P. KIMBALL, of West Barnstable, Massachusetts, and Sarasota, Florida, is now in manuscript form, and its publication is expected within a year. Other check lists of Florida insects will follow.

In collaboration with the Statistical Laboratory at the University of Florida, Plant Board entomologists have developed a system of recording insects, together with host, ecological and distributional data, as they are collected by inspectors and the departmental staff. The system, based on the IBM method of coding material, is proving to be highly efficient in the assembling of data and the statistical analyses of such data.

During the first eighteen years of its existence the State Plant Board published a quarterly, and later a monthly, bulletin, through which inspectors, as well as the public, were kept well informed on problems in its several departments. (Back volumes are available to libraries on an exchange basis.) Under the direction of the present Plant Commissioner, Mr. Ed L. Ayers, seven bulletins have been published since 1953 (with three more in press) on entomological, as well as other, problems.

The Department is quartered in the John F. Seagle Building of the University of Florida, occupying most of one floor of that building.

Members of the staff, except student assistants, are on a full-time basis, with no teaching. They are as follows:

Harold A. Denmark, B.S., M.S., Acting Chief
George W. Dekle, B.S.
Frank W. Mead, B.S., M.S.
Roger A. Morse, B.S., M.S., Ph.D.
Howard V. Weems, Jr., B.A., M.S., Ph.D.
One laboratory technician
Two part-time student assistants
Three secretaries

The Apiary Inspection Department is composed of the Chief Apiary Inspector, Mr. H. S. Foster, nine apiary inspectors and one secretary.

—Roger A. Morse

Review

THE BUTTERFLIES OF THE MALAY PENINSULA by Steven Corbet, D.Sc., Ph.D. (London). British Museum (Natural History), and H. M. Pendlebury, Director of Museums, F.M.S. 1938–45 (First Edition, 1934). Second Edition, revised by Steven Corbet, British Museum (Natural History), and edited by N. D. Riley, C.B.E., F.R.E.S., F.Z.S., Keeper of Entomology, British Museum (Natural History). Published by Oliver and Boyd, Edinborough: Tweedale Court, and London, 39a Welbeck St. W.1, 1956. 537 pages and 55 plates (8 colored). Price, $15.00 U. S.

In the preface to this revised edition Steven Corbet speaks of the death of his partner in the revision, H. M. Pendlebury before its completion, and Mrs. Corbet records the premature death of Steven Corbet in May 1948 when the revised edition was going to press; so that the task of editing fell to Mr. N. D. Riley, Keeper of Entomology at the British Museum. It is indeed sad that neither author of this exhaustive work on the Butterflies of the Malay Peninsula, lived until it was published.

The ground covered in this book is the Malay Peninsula including islands in the Langkawi group, the Island of Penang, the islands of the Tioman and Aor groups, and Singapore. The Malay Peninsula south of latitude 10° N. is the special study, but all Malaysia, which embraces not only this section of the Malay Peninsula but includes also all the islands on the Sunda Shelf, such as Sumatra, Borneo, Java, Bali, and many smaller islands such as Christmas and Cocas-Keeling, etc., is considered. While the authors make many references to the whole territory of Malaysia their collecting was confined chiefly to the Peninsula. As late as the Pleistocene the present Malay Peninsula and the larger islands were united to form a continent called Sundaland, most of which now lies under a shallow sea. It seems certain that the Malay Peninsula was formerly separated from the Asian mainland by an arm of the sea, and the presence of a number of Burman butterflies in the Malay Peninsula that are absent from the Sumatran fauna would indicate that the final union between Malaya and the Asian continent took place

after the separation of the Peninsula proper from Sumatra, Borneo, etc. This is important in the explanation of the distribution of butterflies, because those from Burma are quite few, keeping strictly to the north of the Peninsula and mainly in the highlands, while there has been a strong invasion of Sunda island species in the Peninsula. Nearly 85% of Malayan butterfly species occur also in the islands of Sumatra and Borneo, while those from Burma in the north are not found south of Singapore.

Significant to the collector are the associations of certain groups of butterflies with special plant zones of the Peninsula. In the careful description of these the authors are, as always, consistent to make their work understandable to the amateur as well as to the research entomologist. To this reviewer this is an outstanding achievement since none of the scientific aspects of the study are thereby sacrificed. They speak, on pages 32–35, of the Mangrove Association, the Lowland Open Country Zone, the Lowland Forest and the Highland Forest Zones, naming groups of butterflies found in each.

As we would expect from the geologic history and from the geography, "the conditions obtaining in Malaysia have been highly favorable to the formation of well defined geographical races (or subspecies as they are usually termed), and indeed in most species of butterflies, it is found that each large island of the Archipelago has developed its own distinctive subspecies." There are several types of variation such as seasonal forms due to long ages of environmental influence; while the sexual dimorphism and polymorphism are due to inherited characters, "and are examples of genotypic variation. It may be taken as certain that the races which are widely separated geographically are also reproductively isolated."

There follows a chapter on the many earlier butterfly collectors in the Malay Peninsula, beginning in 1751, when a pupil of Linneaus, one Olaf Toreen, spent two weeks there and ending in 1939 when Pendlebury and Corbet worked the territory so thoroughly. After this come chapters on equipment, labelling, mounting, preservation of insects, etc. Although these are of universal application to all butterfly collectors, there is much

of special interest for those working in tropical or sub-tropical regions. There is also a valuable section on traps and baits.

From page 87, where Part II begins, to page 432 where this section ends, there is a discussion of species with keys to all the families found in the Peninsula, giving the range of each species. This is the heart of the book, the same procedure being followed for all families and all genera. However, to this reviewer, Part III which deals with "A Synonymic List of the butterflies of the Malay Peninsula with particulars of their distribution and references to figures in Distant's Rhopalocera Malayana (1882–86)" is unique in its value to student and collector. In this synonymic list, letters are used to refer to different parts of the Peninsula, and numbers refer to the plant association where the butterfly is found. This detailed work really distinguishes this book from any other book on Lepidoptera that I have seen or used, and is of immense value to all future workers in this region as well as to those research students who want to make further study of certain species without collecting over the whole Peninsula.

On page 481 there is a Census of the Species and Races of butterflies recorded from the Malay Peninsula, and this is followed by a list of food plants of Malayan Rhopalocera. In the clear and simple treatment of the geologic history and of the plant associations, and here in the list of specific food plants of each family, the authors have again made their book available alike to amateur and advanced student. I think this is the special genius of the book. There follow an exhaustive bibliography, various indices, and plates "illustrating genitalia of each family, eight colored plates including a frontispiece illustrating a number of genera and species selected because of their rarity, beauty, or the difficulty of indicating their specific differences in black and white, or to illustrate geographical variation." There are also 26 plates in black and white of the better known Malayan butterflies.

While this large volume can in no sense be called a "Field Guide" I think it would have to be in the "base camp" of every Malayan collector. In other words this is not a book for entomological libraries only, but it should also belong to the individual worker in the South Asian field.—MARGARET M. CARY.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale or services rendered. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and, only when necessary those at the top (being longest in) are discontinued.

Conopidae of the World wanted. Will pay 10¢ to $1.00 for pinned and labelled specimens. S. Camras, 4407 N. Milwaukee Ave., Chicago 30, Illinois.

Anisoptera—Nearctic sp. wanted for exchange, espec. Ophiog., Arigom., Aeschna, Neurocor., Somatoc., Cordulia, Dorocor., Leucor. R. D. Cuyler, Dept. of Entomology, N. C. State College, Raleign, N. C.

Bembicini and Stizini (Hym., Sphec.) of New World wanted for revis. study. Will return upon request or at end of project. James E. Gillaspy, Dept. of Zoology, Univ. Texas, Austin 12, Texas.

Agapema galbina. Will exchange cocoons of this moth for nature books. E. Frizzell, Route 4, Box 96, San Benito, Texas.

Wanted—Data on exact location of colonies of *Epibembex* (olim *Bembix*) (Hymenoptera), any species, any part of country, for biological studies. Howard E. Evans, Dept. Entomology, Cornell Univ., Ithaca, N. Y.

Fanniinae wanted on loan (nearctic and holarctic), and information on collections. James G. Chillcott, Dept. Entom., Univ. of Kansas, Lawrence, Kan. (Loans may be charged to Dr. C. D. Michener.)

Tenebrionidae of the World wanted, in exchange for insects of Argentina and neighboring countries. Horacio J. Molinari, Av. Lib. Gral. San Martin 55, Acassuso (Buenos Aires), Rep. Argentina.

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